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ABSTRACT

This document is divided into: (1) a television curriculum guide and (2) a resource guide. The first describes a four-part television series designed to improve instruction. Section 1 acquaints the participant with some of the issues in distance education, including teacher roles, the impact of technology, parity between the traditional and distance students, and linkages with the larger community. Section 2 discusses the role of instructional design in distance education. The characteristics of the distant learner, especially the special needs student, are described in section 3, together with the partnerships necessary in the implementation of distance education systems. Section 4 focuses on the facility, the learner, and the system, as it analyzes the purpose of evaluation in distance education. Each section contains written goals and objectives, a time line, a list of references, and an evaluation instrument. The second document is a guide to resources in the instructional communications field. Section 1 of this document describes programming resources by the delivery system utilized, and is categorized according to the audience served (59 references). Section 2 is a listing of publications in the field of distance education including books, journals, directories, and newsletters (104 references). Information about related conferences and professional associations is provided in section 3 (15 references). Ten predominant suppliers of instructional telecommunications equipment are listed in section 4. Finally, section 5 contains a glossary of common telecommunications terminology. (DB)

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# IMPROVING TEACHING AT A DISTANCE

By Connie Dillon

and

Mike Price

Print Materials from
A Four Part Television Series
on Distance Education

Produced and Distributed By

Education Extension

Oklahoma State University

April 1990

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# IMPROVING TEACHING AT A DISTANCE

## PART 1

## ISSUES IN DISTANCE EDUCATION

**Call-In Questions at**
**1-800-765-8933**

## IMPROVING TEACHING AT A DISTANCE

## PART 1

## ISSUES IN DISTANCE EDUCATION

**Call-In number for questions and interaction**
**1-800-765-8933**

Co-Hosts: Dr. Connie Dillon, The University of Oklahoma
Dr. Chere Gibson, University of Wisconsin

**Goal**

The goal of this session is to acquaint the participant with some of the issues in distance education to include teacher roles, the impact of technology, parity between the traditional and distance students and linkages with the larger community.

| **Objectives** | **Apprx. Time** |
|---|---|
| 1. The participant will be introduced to the series | 5 min |
| 2. The participant will be introduced to the handout materials | 5 min |
| 3. The participant will be able to describe two predominate distance education models in a K-12 setting. | |
| a. Video presentation of Alberta Canada Model | 20 min |
| b. Site discussion with participants from Alberta | 5 min |
| c. Video presentation of Beaver OK Model | 15 min |
| d. Site discussion with participants from Beaver | 5 min |
| 4. The participant will be able to participate in an analysis of the following issues: teacher roles, institutional support and rewards, and unanticipated consequences of distance education including benefits for the community, problems\possibilities of technology, and impact upon students beyond learning. | |
| a. Break/Discussion at individual sites | 10 min |
| During this break, sites should identify questions for the panel related to the issues described in Objective 4. | |
| b. Reactor Panel for site questions | 20 min |
| With participation from: | |
| Peggy McDonald, Elk City High School Teacher (in studio) | |

Tom Gee, Alberta Distance Learning Project (Audio Bridge)

Lilian Guftason, Alberta Distance Learning Teacher (Audio Bridge)

Julie Bertch, English Faculty, Rio Salado Community College (Audio Bridge)

Jim Bouse, Superintendent, Beaver OK (Audio Bridge)

5. The participant will be able to participate in an analysis of the issues surrounding parity between the traditional and distance students and the contribution of accrediting agency, higher education, public schools and business and industry in insuring parity.

a. Break/Discussion at individual sites 10 min

During this break, sites should identify questions for the panel related to the issues described in Objective 5.

b. Reactor panel for site questions 25 min

Barbara Buzin, Associate Vice Chancellor, Oklahoma State Regents for Higher Education (in studio).

Leigh Walters, ASTS, Oklahoma State Univeristy (in studio).

Dr. Stephen Crow, Deputy Director, North Central Association Colleges and Schools (audio bridge).

Don Sutton, Director, Mind Extension University, Jones Intercable (audio bridge).

Janet Whittaker, Associate Dean of Instructional Technology, Rio Salado Community College (audio bridge).

Gil Gonzales, Associate Dean, Learning Resources Chandler-Gilbert Community College (audio bridge).

6. Summary of Part I Issues and review of Part II, Instructional Design 5 min
Instructional Design.

**Notes/Questions**

1. Objectives 1 and 2:
   Questions/comments about program introduction

2. Objective 3a:
   Questions/comments about the Alberta Canada distance education program.

3. Objective 3b:
   Questions/comments about the Beaver OK distance education program.

4. Objective 4:
   Questions/comments about issues in distance education.

5. Objective 5:
   Questions/comments about parity in distance education.

## REFERENCES


Bruder, Isabelle. (1989) Distance learning: What's holding back this boundless delivery system? *Electronic Learing,* April, 30-35.

Fergis, Thomas H. (1989) Telecommunications at the Des Moines Public Schools. *Educational Technology,* 29 (10), 54-55.

Holmberg, Borje. Chapter 6, Pervasive Themes. (1986) *Growth and Structure of Distance Education.* London: Croom Helm.

Murgatroyd, Stephen and Andrew Woudstra. (1989) Issues in the management of distance education. *American Journal of Distance Education.* 3 (1), 4-19.

## EVALUATION INSTRUMENT

**PART I**
**Please circle the response which most accurately reflects your experience with Part I, Issues in Teaching at a Distance.**

**SA = Strongly Agree  A = Agree  N = Neutral  D = Disagree  SD = Strongly Disagree**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I can describe the Beaver OK distance Education model. | SA | S | N | D | SD |
| 2. | The video presentation about the Beaver OK system was useful. | SA | S | N | D | SD |
| 2. | I can describe the Alberta Canada distance education model. | SA | S | N | D | SD |
| 3. | The video presentation about the Alberta Canada system was useful | SA | S | N | D | SD |
| 4. | As a result of this session, I am familiar with the issues surrounding distance education and teacher roles. | SA | S | N | D | SD |
| 5. | The first panel discussion on distance education issues was useful. | SA | S | N | D | SD |
| 6. | As a result of this session, I am familiar with the issues surrounding parity between traditional and distance students. | SA | S | N | D | SD |
| 7. | The second panel discussion on parity between traditional and nontraditional students was useful. | SA | S | N | D | SD |

**PART 2**

**Please give us your suggestions for improving interactive satellite teleconferences in the future.**

8. What suggestions do you have for improving the interaction among the participating sites.

9. Please describe the strengths of the program.

10. Please suggest process related improvements for future programs.

11. Please suggest ideas for future programs on distance education.

# IMPROVING TEACHING AT A DISTANCE

## PART II

## INSTRUCTIONAL DESIGN IN DISTANCE EDUCATION

## APRIL 12, 1990

**Call-In Questions at**
**1-800-765-8933**

IR014905

# IMPROVING TEACHING AT A DISTANCE

## PART II

## INSTRUCTIONAL DESIGN IN DISTANCE EDUCATION

## APRIL 12, 1990

**Call-In Number for Questions and Interaction:**
**1-800-765-8933**

Co-hosts: Dr. Connie Dillon
University of Oklahoma

Dr. David Lane
Interwest Applied Research

**Goal**

The goal of the session is to acquaint the participant with the role of instructional design in distance education.

**Objectives**

| | | Apprx Time |
|---|---|---|
| 1. | The participant will understand the relationship between distance education issues and instructional design. | |
| | a. Discussion with sites | 5 min |
| 2. | The participant will be able to analyze the relationship between instructional design and learning. | |
| | a. Presentation of Clips/Site Discussion | 10 min |
| 3. | The participant will be able to describe the predominant instructional design components. | |
| | a. Presentation of telecourse material | 10 min |
| | b. Reactor Panel for site discussion | 10 min |
| | With participation from Paul Bosner, Producer/ Director, Center for Telecommunications, Community College District, Dallas TX | |
| | c. Presentation of OSU satellite segments | 10 min |
| | d. Continuation Reactor Panel Discussion | 10 min |
| BREAK | | 10 min. |

4. The participant will be able to describe techniques for designing interaction into distance education.

| | |
|---|---|
| a. Presentation of excerpts from Fairfaix Co./ Shandong,China teleconference | 10 min |
| b. Site Discussion with Fairfax Co. participants | 15 min |
| c. Presentation of excerpts from German by Satellite | 10 min |
| d. Site Discussion with Dr. Harry Wohlert, Professor of German by Satellite. | 15 min |

5. Summary of Part II, Instructional Design and Review of Part III, Methods, Motivation and Technology. 5 min

**Notes/Questions**

1. Objective 1:
   Questions/comments about program introduction.

2. Objective 2:
   Analysis of Segment 1

   Analysis of Segment 2

   Analysis of Segment 3

   Analysis of Segment 4

   Analysis of Segment 5

3. Objective 3:
   Comments/Questions on Instructional Design Components.

4. Objective 4:
   Comments/Questions on designing for interaction.

## REFERENCES


Fairfax County Public Schools. (1989) *The Apple.* FCPS Pursues Global links, from Fairfax Co. 8 (1), 12-13.

The future of instructional design: Part 1 and Part 2. *Educational Technology.* (1981) 21 (8) and (9).

Howard, Dawn C. (1987) Designing learner feedback in distance education. *The American Journal of Distance Education,* 1 (2), 24-40.

Shale, Doug. (1987) Pacing in distance education: Something for everyone? *The American Journal of Distance Education,* 1 (2), 21-33.

Winn, William. Media and Instructional Methods. From Garrison, D.R. and Doug Shale. (Eds.) (In press). *Education at a Distance: From Issues to Practice.* Melbourne, Fl: Krieger.

White, Thomas W. Wilkinson and Thomas M. Sherman. (1989). Distance education and student procrastination. *Educational Technology,* 29 (12), 24-27.

Wright, Clayton. R. (1988) The independent/distant study course development team. *Educational Technology.* 28 (12). 12-17.

## EVALUATION INSTRUMENT

### PART I

**Please circle the response which most accurately reflects your experience with Part II, Instructional Design.**

**SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I understand the role of instructional design for distance education. | SA | S | N | D | SD |
| 2. | The analysis of the instructional design features in the video clips segment was useful. | SA | S | N | D | SD |
| 3. | I can describe the predominant instructional design features. | SA | S | N | D | SD |
| 4. | The discussion of the telecourse segments was useful. | | | | | |
| 5. | The discussion of the OSU satellite segments was useful. | SA | S | N | D | SD |
| 6. | I can describe techniques for designing interaction into distance education programs. | SA | S | N | D | SD |
| 7. | The discussion of the Fairfax County/Shandong China project was useful. | SA | S | N | D | SD |
| 8. | The discussion of the German by Satellite program was useful. | SA | S | N | D | SD |

### PART II

**Please give us your suggestions for improving interactive satellite teleconferences in the future.**

8. What suggestions do you have for improving the interaction among the participating sites.

9. Please describe the strengths of the program.

10. Please suggest process related improvements for future programs.

11. Please suggest ideas for future programs on distance education.

# IMPROVING TEACHING AT A DISTANCE

## PART III

## IMPLEMENTATION, METHODS, MOTIVATION

## APRIL 19, 1990

**Call-In Questions at**
**1-800-765-8933**

**IMPROVING TEACHING AT A DISTANCE**

**PART III**

**IMPLEMENTATION, METHODS, MOTIVATION**

**APRIL 19, 1990**

**Call-In Number for Questions and Interaction:**
**1-800-765-8933**

Co-hosts: Connie Dillon
University of Oklahoma

Judy Garcia
Fairfax County Public Schools

**Goal**

The goal of this session is to familiarize the participant with the characteristics of the distance learner, particularly the special needs student. This session will also focus upon the partnerships necessary in the implementation of effective distance education systems.

| **Objectives** | | | **Appx Time** |
|---|---|---|---|
| 1. | | The participant will understand the relationship between instructional design and implementation, methods, and motivation. | |
| | a. | Discussion with sites | 5 min |
| 2. | | The participant will be able to describe a model for involving the special needs student in distance education | |
| | a. | Introduction to video presentation | 3 min |
| | b. | Video presentation of New Mexico's Educational Native American Network (ENAN) and Computers in the Science Classroom (CISCO-NET) | 20 min |
| | c. | Break/Discussion at individual sites | 10 min |
| | d. | Reactor panel for site discussion | 10 min |
| | | With participation in studio from Dr. Charlotte Gunawardena, Assistant Professor of Distance Education, University of New Mexico and Joyce Nichols, Instructor of Basic English and Reading, Oklahoma State University | |

3. The participant will be able to describe the role of staff development in distance education

   a. Video presentation on NASA staff development project — 10 min

   c. Discussion with sites — 10 min

      With Malcom Phelps, Director of Midlands Consortium Star Schools Project and Coordinating Producer of the NASA Education Video Conference Series, Oklahoma State University.

4. The participant will be able to describe the role of partnerships in implementing distance education programs

   a. Introduction to video presentation — 5 min

      Audio bridge with Marge Wilsman, Project Director, Education Services Division, Wisconsin Public Radio and Television.

   b. Video presentation of Wisconsin Rural Reading Improvement Project — 20 min

   c. Break/Site Discussion — 10 min

   d. Reactor Panel for site discussion

      With participation from Marge Wilsman, Dan Barron, School of Library Science, University of South Carolina and Malcom Phelps.

5. The participant will understand the role of the library media specialist in distance education.

   a. Introduction to video presentation — 2 min

      Audio bridge with Dan Barron, University of South Carolina

   b. Video presentation on the role of the library media specialist in distance education — 10 min

   c. Reactor Panel for site discussion — 10 min

      • With Dan Barron, Marge Wilsman, and Malcom Phelps

5. Summary of Part III, Implementation, Methods, and Motivation and introduction to Part IV, Assessing Distance Learning — 5 min

**Notes/Questions**

1. Objective 1:
   Questions/Comments about program introduction.

2. Objective 2:
   Questions/Comments about distance education and the special needs student.

3. Objective 3:
   Questions/Comments about staff development in distance education.

4. Objective 4:
   Questions/Comments about the role of partnerships in distance education.

5. Objective 5:
   Questions/Comments about the role of the library media specialist in distance education.

## References


Barron, Daniel D. (1989) Distance Education: Removing barriers to knowledge. *School Library Journal,* November, 28-33.

Barron, Daniel D. (1990) Television: Our forgotten medium, Part II. *School Library Media Activities Monthly,* 6,(5), 47-50.

*Educational Technology.* (1989) Teacher Technology Training. 29 (3).

Edwards, Barbara J. and Mark A. Koorland. (1990) Telecommunications skills training for students with learning disabilities: An exploratory study. *Educational Technology.* 30, (1), 34-36.

Harris, Judith B. (1989) Tailoring telecommunications innovations to fit educational environments. *Educational Technology.* 29 (11), 7-11.

Pratt, Daniel D. (1988) Andragogy as a relational construct. *Adult Education Quarterly,* 38 (3), 160-172.

**PART I**

**Please circle the response which most accurately reflects your experience with Part III, Implementation, Methods and Motivation.**

**SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I understand the relationship between instructional design and implementation, methods, and motivation. | SA | A | N | D | SD |
| 2. | I understand methods for involving the special needs student in distance education. | SA | A | N | D | SD |
| 3. | The video presentation on the New Mexico system was useful. | SA | A | N | D | SD |
| 4. | The panel discussion on the special needs student was useful. | SA | A | N | D | SD |
| 5. | I am able to describe the role of staff development in distance education. | SA | A | N | D | SD |
| 6. | The video presentation on the NASA staff development project was useful. | SA | A | N | D | SD |
| 7. | The panel discussion on the NASA staff development project was useful. | SA | A | N | D | SD |
| 8. | I am able to describe the role of partnerships in implementing distance education systems. | SA | A | N | D | SD |
| 9. | The video presentation on the Wisconsin Rural Reading Improvement Project was useful. | SA | A | N | D | SD |
| 10. | I am able to describe the role of the library media specialist in distance education. | SA | A | N | D | SD |
| 11. | The video presentation on the library media specialist was useful. | SA | A | N | D | SD |

**PART 2**

**Please give us your suggestions for improving interactive satellite teleconferences in the future.**

12. What suggestions do you have for improving the interaction among the participating sites.

13. Please describe the strengths of the program.

14. Please suggest process related improvements for future programs.

15. Please suggest ideas for future programs on distance education.

# IMPROVING TEACHING AT A DISTANCE

# PART IV

# ASSESSING DISTANCE EDUCATION

by

**Connie Dillon, Ph.D.**
**University of Oklahoma**
**and**
**Dan Coldeway, Ph.D.**
**Athabasca University**

**April 26, 1990**

IR014905

**IMPROVING TEACHING AT A DISTANCE**
**PART IV**
**ASSESSING DISTANCE EDUCATION**
**April 26, 1990**

**Co-hosts:** Dr. Connie Dillon
University of Oklahoma

Dr. Dan Coldeway
Athabasca University

**Goal**

This session analyzes the role of assessment in distance education, focusing upon the facility, the learner, and the system. This session also describes distance education research by summarizing past research and discussing the new research agenda.

| **Objectives** | | **Time** | **Appx** |
|---|---|---|---|
| 1. | Site questions from prior program | 5 min | |
| 2. | The participant will understand the interrelationship between Issues, Instructional Design, Implementation and Assessment in Distant Education. | | |
| | a. Discussion with sites | 5 min | |
| 3. | The participant will be able to describe relevant distance education research to include: research focusing upon the media, research focusing upon the learner and research focusing upon the system. | | |
| | a. Presentation with Dr. Dan Coldeway | 5 min | |
| | a. Panel Discussion/Discussion with sites | 10 min | |
| | Audio Bridge with Dr. Byron Burnham, Utah State University | | |
| 4. | The participant will be able to describe an effective distant learning environments to include acoustics, lighting, seating and seating arrangements and decor. | | |
| | a. Introduction to video presentation | 5 min | |
| | With Mike Price, AIA, Kellogg Research Fellow | | |
| | b. Video presentation | 15 min | |
| | c. Break/Sites complete facility assessment form | 10 min | |

5. The participant will be able to discuss the relationship between learning and physical environment.

   a. Reactor Panel/Discussion with sites

   Audio bridge with Jim Ryden, AIA with Armstrong, Torseth, Skold and Ryden, Architects and Engineers, Minneapolis, Minn. ..... 10 min

6. The participant will be able to describe four types of evaluations pertinent to distance education systems including outcome evaluation, diagnostic evaluation, descriptive evaluation and documentation.

   a. Presentation/Panel Discussion ..... 10 min

   Audio bridge with Dr. William Bergquist, President, The Professional School of Psychology

   b. Break/Discussion at individual sites ..... 10 min

   c. Reactor panel ..... 10 min

7. The participant will be familiarized with the types of instruments used to assess the distant student's learning, and the advantages and disadvantages of the common instruments used.

   a. Presentation/Panel discussion ..... 10 min

   With Dr. Charles Feasley, Director of Independent and Correspondence Study, Oklahoma State University.

   b. Discussion with sites ..... 10 min

8. Summary of Series ..... 5 min

**Notes/Questions/**

1. Objective 2:
   Questions/comments about the interrelationship between Issues, Instructional Design, Implementation and Assessment in distant education.

2. Objective 3:
   Questions/Comments about relevant distance education research.

3. Objective 4:
   Questions/Comments about effective distant learning environments.

4. Objective 5:
   Questions/Comments about the relationship between learning and physical environments.

5. Objective 7:
   Questions/Comments about evaluating distance educations systems.

6. Objective 6:
   Questions/Comments about the types of instruments used to assess the distant student's learning.

## References


Burnham, Byron R. and R. Alan Seamons. (1987) Exploring the landscape of electronic distance education. *Lifelong Learning,* 11(2), 8-11.

Chute, Alan G., Lee B. Balthazar and Carol O. Poston. (1988) Learning from teletraining. *American Journal of Distance Education.* 2 (3), 55-63.

Clark, Richard E. and Gavriel Salomon. (1986) Media in teaching. In Merlin Wittrock (Ed.) *Handbook of Research on Teaching.* New York: McMillan Publishing Company.

Coggins, Chere Campbell. (1988) Preferred learning styles and their impact on completion of external degree programs. *American Journal of Distance Education,* 2 (1), 25-37.

Coldeway, Dan O. (1988) Methodological issues in distance educational research. *American Journal of Distance Education.* 2 (3), 45-55.

Cookson, Peter S. (1989) Research on Learners and Learning in Distance Education: A Review. *American Journal of Distance Education.* 3 (2), 22-34.

Grimes, Paul W., Joyce E. Nielson and James F. Niss. (1988). The performance of nonresident students in the "Economics U$A" telecourse. *American Journal of Distance Education,* 2 (2), 36-43.

Guba, Egon G. and Yvonna S. Lincoln. (1987) *Effective Evaluation.* San Francisco: Jossey-Bass.

Hoyte, Donald P. and David W. M. Frye. (1972). *Effectiveness of Telecommunications as an Educational Delivery System: Final Report.* (Project No. G 035, Grant No. OEC-7-72-0008[509]. Washington, D.C., U.S. Department of Health, Education and Welfare, Office of Education, National Center for Educational Research and Development.

Levine, Toby H. (1989) SERC passes pilot semester test. *Tech Trends.* Nov/Dec, 16-19.

McCleary, Iva Dene and M. Winston. (1989) Program design and evaluation: Two-way interactive television. *The American Journal of Distance Education,* 3 (1), 50-60.

Whittingon, Nil. (1987). Is instructional television educationally effective? A research review. *The American Journal of Distance Education.* 1 (1): 47-57.

## Evaluation
## Part IV, Assessing Distance Learning

**PART I**

**Please circle the response which most accurately reflects your experiences with Part, IV, Assessing Distance Learning.**

**SA = Strongly Agree A = Agree N = Neutral D = Disagree SD = Strongly Disagree**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I understand the interrelationship between Issues, Instructional Design, Implementation and Assessment in distant education. | SA | A | N | D | SD |
| 2. | I can to describe relevant distance education research. | SA | A | N | D | SD |
| 3. | The panel discussion on distance education research was useful. | SA | A | N | D | SD |
| 4. | I can describe an effective distant learning environment. | SA | A | N | D | SD |
| 5. | The video presentation on effective distance learning environments was useful. | SA | A | N | D | SD |
| 6. | I understand the relationship between learning and physical environment. | SA | A | N | D | SD |
| 7. | The panel discussion o the relationship between learning and physical environment was useful. | SA | A | N | D | SD |
| 8. | I can describe the types of instruments used to assess the distant student's learning | SA | A | N | D | SD |
| 9. | I understand the advantages and disadvantages of the common instruments used to assess distance learning. | SA | A | N | D | SD |
| 10. | The video presentation on instruments for assessing distance learning was useful. | SA | A | N | D | SD |
| 11. | I understand the relationship between effective distance education systems and learning. | SA | A | N | D | SD |
| 12. | I can describe the four types of evaluations pertinent to distance education systems including outcome evaluation, diagnostic evaluation, descriptive evaluation and documentation | SA | A | N | D | SD |
| 13. | The panel discussion on the evaluation of distance education systems was useful. | SA | A | N | D | SD |

**PART 2**

**Please give us your suggestions for improving interactive satellite teleconferences in the future.**

14. What suggestions do you have for improving the interaction among the participating sites.

15. Please describe the strengths of the program.

16. Please suggest process related improvements for future programs.

17. Please describe the strengths of the series.

18. Please describe the weaknesses of the series.

19. Please suggest ideas for future programs on distance education.

# IMPROVING TEACHING AT A DISTANCE
# A GUIDE TO RESOURCES

by

Connie Dillon, Ph.D.
Dana Blanchard
Mike Price

Oklahoma Research Center for Continuing Professional
and Higher Education
University of Oklahoma

April, 1990

IR014905

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## Introduction

A common concern among those working in the instructional telecommunications field relates to information...not so much where to find it but how to manage it. Unfortunately, no simple answer exists. A single clearinghouse providing information relative to learning by telecommunications is not available. Part of the difficulty is the constant change associated with the field. Often, resrouces cited even within the past year or two no longer exist.

The growth in the telecommunications industry within the past decade has prompted a plethora of activity associated with distance education. This booklet is an attempt to organize some of the varied resources within the realm of instructional telecommunications in order to provide a guide to those interested in learning more about "learning at a distance".

This guide consists of five sections. Section I describes programming resources identified by the delivery system utilized, whether satellite, cable, or computer and is categorized according to the audience served. Section II is a listing of publications in the field of distance education including books, journals, directories and newsletters. Section III provides information about related conferences and professional associations. Section IV lists a few of the predominant suppliers of instructional telecommunications equipment. The final part, Section V is a glossary of common telecommunications terminology.

# SECTION I

# PROGRAMMING OPPORTUNITIES

## Satellite, Cable and Computer Networks

# SECTION I

## PROGRAMMING OPPORTUNITIES

### Satellite, Cable and Computer Networks

This section briefly describes some of the programming resources available on the predominant delivery systems. The resources are organized according to the intended audience, including K - 12, post secondary education, continuing professional and continuing higher education, and business and industry.

**Kindergarten-12th Grade**

*Arts and Sciences Teleconferencing Service (ASTS)*

Offering live interactive course taught via satellite to schools throughout the country including courses in upper level math and sciences, foreign languages, social studies, and remedial reading. Publishes *Setting Up ASTS Courses 1989-90*, a guide for setting up ASTS courses and includes practical information about hardware and facilities.
Contact: Missie Murnan, ASTS, Oklahoma State University, 401 Life Sciences East, Stillwater, OK 74078 (405)744-7895.

*Assignment Discovery*

As an automatic part of the service of local cable operators, schools (K-12) can tape and use programs on the Discovery Channel related to their curriculum. $100/year/ school building will include a monthly guide to programming, a newsletter designed to help teachers integrate programming into the curriculum, and other facilitating materials.
Contact: The Discovery Channel, Box AD, 8201 Corporate Drive, Landover MD 20785, (800) 321-1TDC

*Whittle Communications*

Non-commercial educational programs for school aged children are offered to public schools. A special installation service can also be provided for schools as yet uninitiated into telecommunications. Services include Channel One presenting the latest national and international news targeting teenagers, the Classroom Channel which provides non-commercial programming from a variety of educational programming sources, and the Educators' Channel designed to provide programming for educators and to develop linkages among participants.
Contact: Whittle Communications, 505 Market Street, Knoxville TN 37902, (615) 595-5100

*C-Span in the Classroom*

Schools (k-12 & higher education) are offered the rights to tape programming off the air for later use as well as free membership to a service which provides an educator's guide, a newspaper with related information and other publications.
Contact: Linda Heller, Director of Educational Services, C-Span, 444 North Capitol St.,NW, Washington, DC 20001 (800) 523-7586 or (202) 737-3220

*The Educator's Channel*

This satellite service provides professional development programs for teachers, administrators, and school board members concerned with grades K-12. The service also provides special initial installation when needed.
Contact: Whittle Communications, 505 Market Street, Knoxville TN 37902, (615) 595-5100

*Education Satellite Network (ESN)*

A network of member schools share instructional programs including live teleconferences for K-12 students, teachers and administrators.
Contact: Betty McCarthy, Missouri School Boards Assoc., 2100 1-70 Drive S.W., Columbia, MO 65203 (314) 445-9920.

*France-TV Magazine*

University of Maryland-Baltimore County, AC-IV, Room 214, Baltimore, MD 22128-5398 (301) 455-4458.

*KITES (Kids Interactive Telecommunications by Satellite)*

The project is an example of a consortium involving public secondary schools, higher education, and private industry. John LeBaron at the University of Lowell originated the idea and was supported by the Massachusetts Corporation for Educational Telecommunications (MCET), Massachusetts Educational Television, German educators, and the Digital Equipment Corporation. The project linked Massachusetts and German high school classrooms in a cross-cultural exchange.

*The Learning Channel*

This cable channel provides Electronic Library, two hours/day programming which can be used live or taped with curriculum-related information. A monthly programming guide, quarterly program reference manual, and bi-annual newsletter are all available at no charge. Professional development programs for educator is also available.
Contact: Molly Breeden, Assistant Director of Educational Services, The Learning Channel, 1525 Wilson Blvd., Suite 550, Rosslyn VA 22209, (800) 346-0032

*Midlands Consortium*

The satellite consortium represents public schools, state departments of education, state school board associations, and leading universities in Alabama, Kansas, Mississippi, Missouri, and Oklahoma. The goals of the consortium are to establish and facilitate the use of satellite-based instructional programs in subject areas for students as well as staff development programs for teachers and administrators. A Star Schools Partnership.
Contact: Malcolm Phelps, Midlands Consortium Star Schools Project, Oklahoma State University, 309 North Cordell, Stillwater OK 74078; (405) 744-8131

*News Access*

A subscription to this weekly service allows schools to tape CNN's The Week in Review and utilize a weekly guide for integration of the program into various subject areas.
Contact: Educational Systems Corporation, C/O Media Management Services, Inc., 10 North Main St., Suite 301, Yardley PA 19067-9986, (800) 637-8509

*Satellite Educational Resources Consortium (SERC)*

The satellite consortium delivers K-12 courses and teacher training programs in 14 participating states and cities in 2 other states. Participating schools can receive funding assistance to install satellite receiving equipment. A Star Schools Partnership.
Contact: Gail Arnall, Satellite Educational Resources Consortium, POB 160, Oxen Hill MD 20745; (301) 839-8025

*Satellite Telecommunications Educational Programming (STEP)*

Educational Services District 101, West 1025 Indiana, Spokane, WA 99205.
Contact: Ted Roscher (505) 456-7660

*Satellite Telecommunications Educational Programming (STEP)*

The satellite services offers highschool level as well as a variety of teacher in-service programs. It serves western Washington state as well as selected schools throughout North America.
Contact: T.A. (Ted) Roscher, Telecommunications Division, Satellite Telecommunications Educational Programming, East 4022 Broadway, Spokane, WA 99202, (509) 536-0141.

*Technical Education Research Centers (TERC).*

An interactive satellite consortium which delivers K-12 courses to sites in Massachusetts, Michigan, Minnesota,m New York, Virginia and "adjacent states". A Star Schools Partnership
Contact: Cecilia Link, Director, Technical Education Research Centers, 1696 Massachusetts Ave., Cambridge MA 02138.

*TI-IN United Star Network*

TI-IN services includes interactive satellite programs using electronic writing tablets for student responses to teacher's questions. The network serves 244 Indian and Chapter 1 schools in 16 states. A Star Schools Partnership.
Contact: Pam Pease, Director, TI-IN United Star Network, 1000 Central Parkway North, Suite 190, San Antonio TX; (512) 490-3900

**Post Secondary Education**

*Black College Satellite Network (BCSN)*

P.O. Box 961-Administration Building, Howard University Campus, Washinton, DC 20059.

*California State University, Chico*

With ITFS/Microwave and satellite systems, the university provides college level courses for off-campus students in northern California and for corporate clients throughout the United States. In addition, the university produces ad hoc teleconferences to a nationwide audience.
Contact: Leslie Wright, Associate Dean, The Center for Regional and Continuing Education, California State University-Chico, Chico CA 95929-0250; (916) 895-6105

*Community College Instructional Television Network (CCIT)*

Director of Televised Services, Community Colleges of Connecticut, Hartford, CT 06105.

*Community College of Maine-Telecommunications (CCM/T)*
University of Maine at Augusta, University Heights, Augusta, ME 04330

*George Washington University*
The university's continuing engineering education division utilizes live satellite-delivered conferences as well as videocassettes and audiocassettes on engineering, economics, and management
Contact: Continuing Engineering Education, The George Washington University, Washington DC 20052

*Intermountain Community Learning & Information Services (ICLIS)*
ICLIS is a consortium serving rural residents of Colorado, Montana, Utah, and Wyoming. Its function includes sharing education, training programs, and library & information resources through ICLIS community centers.
Contact: Glenn Wilde, ICLIS principal investigator, College of Humanities, Arts, & Social Sciences, Utah State University, Logan UT 84322-0700, (801) 750-1201

*International University Consortium*
Membership in the consortium gives access to a number of video/audio-assisted courses on a variety of college credit courses
Contact: The International University Consortium, The University of Maryland University College, University Boulevard at Adelphi Road, College Park MD 20742-1612; (301) 985-7811

*The Mind Extension University*
The nonprofit educational service provides college-level credit courses in a joint effort with accredited colleges and universities.
Contact: Don Sutton, Executive Director, The Mind Extension University, 9697 E Mineral Ave., Englewood CO 80112, (800) 777-MIND

*National Technological University (NTU)*
A non-profit corporation offering courses originating from 21 participating universities. The courses focus exclusively upon engineering disciplines and related fields. NTU delivers instructional programs to enrollees at their employment locations. For academic purposes, the participating university awards academic degrees, not NTU.
Contact: National Technological University, P.O. Box 700, Fort Collins CO 80522, (303) 491-6092.

*National University Teleconferencing Network (NUTN)*
A consortia of 250 higher education institutions serving higher education teleconferencing needs and the needs of their affiliates in business, industry, government, & professional associations. NUTN has also offered 100 (non-credit) programs to the general public. Other services include training, consulting, and marketing.
Contact: National University Teleconference Network, 332 Student Union, Oklahoma State University, Stillwater OK 74078-0653, (405) 744-5191

*Oklahoma State University Education Extension*

Produces high quality staff development programs for teachers and administrators throughout the United States. These interactive satellite delivered conferences feature experts in the field of education. Programs are also available by video tape purchase.
Contact: Office of Education Extension, OSU, Stillwater, Oklahoma 74078; (800) 765-8693.

*PBS Adult Learning Satellite Service*

PBS delivers a variety of educational programming directly to colleges and universities via satellite. Currently there are 200 full-fledged ALSS colleges and 1,100 more using some ALSS services (telecourses, live videoconferencing, & programming resources). Basic ALSS participation fee is $2500/academic year (which includes the Business Channel, See citation under business and industry).
Contact: PBS Adult Learning Satellite Service, 1320 Braddock Place, Alexandria, VA 22314-1698, (800) 257-2578 or (703) 739-5360.

**Continuing Professional Education**

*American Hospital Association (AHA)*
Contact: Paula Morales (312) 280-6052

*American Law Network (ALN)*
Contact: Lawrence F. Meehan, Jr. (215) 243-1681

*American Management Association (AMA)*
Contact: Joan Milczarski (212) 903-8115

*Continuing Legal Education Satellite Network, Inc. (CLESN)*
Contact: George Heroux (217) 525-0774

*Hospital Satellite Network (HSN)*
Contact: Bart Penfold or David Kerin (213) 277- 6710

*Institute of Electrical and Electronics Engineers (IEEE)*
Contact: Dr. Robert G. Kahrmann (201) 562-5491

*Institutional Research Network, Inc. (IRN)*
Contact: Felicia Lopez-Walker (212) 213-7670

*NASA Educational Satellite Videoconferences*

The interactive videoconferences are designed to enhance a teacher's skill in teaching aerospace concepts in the classroom and inform them of available NASA educational resources.
Contact: NASA Aerospace Education Services Project, Videoconference Site Registration, 300 North Cordell, Oklahoma State University, Stillwater OK 74078-0422

*Westcott Communications*

This satellite television network focuses on mini-networks that beam live and original programs to select business audiences. Currently, Westcott operates the Automotive Satellite Television Network (ASTN) and the Law Enforcement Television Network (LETN) and are planning three more specialized areas for 1991. (See also in Business and Industry).
Contact: Leslie Crozier, Westcott Communications, 1303 Marsh Lane, Carrolton TX 75006; (214) 417-4191

**Business and Industry**

*Business Channel*

This network has live business video-conferences, training, and resource programming and has a fee of $500/12 mo. license period.
Contact: PBS Adult Learning Satellite Service, 1320 Braddock Place, Alexandria VA 22314-1698, (800) 257-2578 or (703) 739-5360

*Westcott Communications*

This satellite television network focuses on mini-networks that beam live and original programs to select business audiences. Currently, Westcott operates the Automotive Satellite Television Network (ASTN) and the Law Enforcement Television Network (LETN) and are planning three more specialized areas for 1991. (See also in Continuing Professional and Higher Education).
Contact: Leslie Crozier, Westcott Communications, 1303 Marsh Lane, Carrolton TX 75006; (214) 417-4191

**General Audiences**

*National Captioning Institute*

The institute facilitates the use of decoders for many programs on television with could be used as a resource in reading programs for remedial readers, adult beginning readers, ESL students, etc.
Contact: The National Captioning Institute, Department LDSK, 5203 Leesburg Pike, Falls Church VA 22041, (703) 998-2400

*North Carolina Agency for Public Telecommunications*

The agency operates the State Services Network to distribute satellite programs on adult basic education, job skills training, and specialized educational opportunities to public schools, community colleges, prisons, and libraries in North Carolina.
Contact: Ivy Hoffman, Assistant Director, Agency for Public Telecommunications, 116 West Jones St., Raleigh NC 27603-8003; (919) 733-6341.

*Public Service Satellite Consortium*

The consortium provides information, consultation, research & training concerning the use of satellite and other telecommunications for public service. $500/year membership.
Contact: Public Service Satellite Consortium, Suite 220, 600 Maryland Avenue SW, Washington, DC 22024, (202) 863-0890

*WHRO-TV Channel 15/ WHRO-FM 89.5*

Service offers satellite delivered programs, video conferences, also well as videotape and videodisc educational products.
Contact: Lawrence Crum, Educational Telecommunications, WHRO-TV Channel 15, 5200 Hampton Boulevard, Norfolk VA 23508, (804) 489-9476

## COMPUTER NETWORKS

### K-12, Post-Secondary Education

*AT&T Long Distance Learning Network*

Learning circles by grade level & curriculum areas of groups of classrooms through electronic mail (3rd-12th grades). Additional services included in the subscription rate: learning circle coordinator, communication software, tutorial disk, & newsletter.
Contact: AT&T Long Distance Learning Network, P.O. Box 716, Basking Ridge NJ 07920-0716; (800) 367-7225 ext. 4158

*Computer Pals Across the World*

Non-profit international writing project through electronic mail which matches one classroom (K-12 & above) to another within or between countries. Cost approx. $30-40/mo if matched to another country or $20-25/mo if within country.
Contact: Jim Erwin, Founder & USA Coordinator, 4974 SW Galen, Lake Oswego OR 97035

*Dialog Classmate*

An instructional program that introduces online information retrieval to students in elementary through graduate level curriculums. Offers access to 80 databases of Dialog. Other services include teacher training (complimentary), teacher's guide, student workbooks. Currently $15/connect hour.
Contact: Dialog Information Services, Inc., 3460 Hillview Avenue, Palo Alto CA 94304; (800)334-2564

*Dialog CIP*

An instructional program on information retrieval designed for graduate, undergraduate, & specialized high school programs. Offers access to 300 Dialog databases. Other services include faculty training (complimentary), curriculum materials, reference manual & training video. Currently $15/connect hour
Contact: Dialog Information Services, Inc., 3460 Hillview Avenue, Palo Alto CA 94304; (800)334-2564

*Dialog Business CIP*

Menu-driven online information retrieval for undergraduate and graduate business school programs. Also available are lesson plans, practice exercises, case studies, & other support materials. Currently $15/connect hour.
Contact: Dialog Information Services, Inc., 3460 Hillview Avenue, Palo Alto CA 94304; (800) 334-2564

*EDUNET*

The individualized, interactive educational program uses computer online telecommunications to service the rural school districts in the northwest United States. Course subjects vary widely and are geared from elementary to post-secondary levels.
Contact: EDUNET, P.O. Box 9121, Helena, MT 59601; (406) 442-8090 ext. 42 or call the EDUNET computer at (406) 449-2503 and logon as "Stranger"

*Einstein*

The service is geared to teach teachers and high school students to perform online searches.
Contact: Einstein Customer Service, Educational Broadcasting Corp, Learning Link, 356 W. 58th St. New York NY 10019

*FrEdMail*

A teacher-created low cost network of 90 bulletin boards is used locally and as a national network for two conference groups, IDEAS (for teachers) and KIDWIRE (for students
Contact: Al Rogers, 4021 Allen School Road, Bonita CA 92002; Compuserve 76167,3514

*KIDSNET*

The service is available online through ALANET and has a collection of information about radio, television, and nonbroadcast video programs for young people.
Contact: ALANET (800) 545-2433 or KIDSNET, 6856 Eastern Ave NW, Suite 208, Washington DC, (202) 291-1400

*National Geographic Kids Network*

The electronic mail network focuses on hands-on science curriculum for grades 4-6, but also includes some geography and social studies. The system is used to connect classrooms and experts around the world to compare data, and prepare joint reports.
Contact: Dorothy Perreca, National Geographic Kids Network, National Geographic, Washington DC 20036; (202) 775-6580

*Technical Education Resource Centers (TERC)*

The interactive program in 7th-12th grade math and science uses computers and modems to establish a public, wide-area data network. Five curriculum units have been developed.
Contact: Cecilia Lenk, Director, Technical Research Centers, 1696 Massachusetts Ave, Cambridge MA 02138: (617) 547-0430

**Adult Education**

*AEDNET*

Electronic message network for adult educator around the world for discussions, announcements, and a referred electronic journal, New Horizons in Adult Education (see below).
Contact: Barbara Florini, Syracuse University Kellogg Project, 113 Euclid Avenue, Syracuse NY 13244-4160; or e-mail AEDNET@SUVM.

*International Information Sharing Network (IISN)*

Electronic mail used to link 300 practitioner, researchers, & policy makers through an information counselor. Used in particular to address needs of adult educators from developing countries.

Contact: Beth Oddy, Information Counsellor, Kellogg Project, 113 Euclid Avenue, Syracuse NY 13244-4160; or e-mail ECODDY@SUVM; (315) 443-1095

**General Audiences**

*Knowledge Index*

Command or menu driven after-hours online information retrieval service offering 75 Dialog databases. Currently $35 startup fee and $24/connect hour

Contact: Dialog Information Services, Inc., 3460 Hillview Avenue, Palo Alto CA 94304; (800) 334-2564

*New Horizons in Adult Education*

A free, referred, electronic journal managed by adult education graduate students. Its contents are indexed in ERIC and it is transmitted over AEDNET.

Contact: Editor, New Horizons in Adult Education, Syracuse University Kellogg Project, 113 Euclid Avenue, Syracuse NY 13244-4160; or e-mail HORIZONS@SUVM; (315) 443-1095

*Participate*

A computer conferencing system being used to deliver adult education courses.

Contact: Distance Education Program, Barbara Florini, 113 Euclid Avenue, Syracuse NY 13244-4160; or e-mail BFLORINI@ SUVM

## SECTION II
## PUBLICATIONS

## SECTION II

## PUBLICATIONS

This section contains a listing of publications within the field of distance education including books, periodicals, newsletters, directories and conferences and professional association which cover both distance education and instructional telecommunications. Each are referenced by both subject area and focus, whether scholarly or practitioner oriented. Although this list is not exhaustive, it provides a thorough description of the current literature in the field.

**Journals with A Scholarly Emphasis**

*The American Journal of Distance Education*
Contact: Pennsylvania State University, Office for Distance Education of the College of Education, University Park PA 16802.

*British Journal of Educational Technology.*
Published by the Council For Educational Technology for the United Kingdom, 3 Devonshire St., London S1N2BA, England.

*Canadian Journal of Distance Education*
Published by Canadian Association of Distance Teaching
Contact: June Sturock, editor, Simon Frazier University, Burnaby British Columbia, Canada V5A1S6

*Distance Education*
Articles on theory, research, and practice in distance education
Contact: Ian McD. Mitchell, editor, South Australian College of Advanced Education, Underdale, Australia 5032

*Educational Communication and Technology Journal*
Quarterly journal of theory, research and development related to technological processes in education; $24/yr
Contact: Association for Educational Communications and Technology Inc., 1126 Sixteenth ST. NW, Washington DC 20036

*EMI Educational Media International*
Quarterly journal of the International Council for Educational Media
Contact: ICEM/CIME Secretariat, c/o R. Lefranc, 29 rue d'Ulm, 75230 Paris, Cedex05, France

*Educational Technology Research and Development*
(formerly Journal of Instructional Development)
Includes topics on adult, career, & vocational education, educational psychology, educational technology systems, tests, measurement & evaluation
Contact: 1126 16th St. NW, Washington DC 20036

*Journal of Computer Based Instruction*

Publihsed by the Association for the Development of Computer-Based Instructional Systems, Western Washington Universiyt, Miller Hall, No. 409, Bellingham, WA 98224, (206)676-2860.

*Journal of Educational Technology Systems*

Quarterly journal published by the Society for Applied Learning Technology
Contact: Baywood Publishing Co Inc., 26 Austin Ave, POB 337, Amityville NY 11701

*Media in Education and Development*
(formerly Educational Broadcasting International).

Contact: Taylor Francis, Ltd, Rankine Rd., Baoingstoke, Hants R6240PR, England.

*Teaching at a Distance*

Published by The Open University, Walton Hall, Melton Keynes MK76AA, England

*Performance & Instruction Journal*

Monthly cross-disciplinary journal of the National Society for Performance and Instruction on the improvement of human performance with emphasis on direct application to the work world; $50/yr. nonmembers
Contact: Performance & Instruction, 1126 Sixteenth St NW, Suite 315, Washington DC, 20036

*IEEE Technology and Society*

Quarterly journal of the Institute of Electrical & Electronics Engineers with some sporadic articles on telecommunications
Contact: Institute of Electrical & Electronic Engineers Inc., 345 East 47th St, New York NY 10017-2394

*Telecommunications Policy*

Quarterly journal $612/yr.
Contact: Butterworth Publishers, 80 Montvale Ave., Stoneham MA 02180

**Journals with a Practitioner Emphasis**

*Business TV*

A practitioner oriented magazine on television for business use emphasizing education uses. Request for free subscriptions can be made on company (institutional) letterhead.
Contact: TeleSphan's Business TV, c/o Telespan Publishing Corporation, PO Box 6250, Altadena CA 91001

*Communications News*

Monthly magazine $27/yr.
Contact: Harcourt Brace Jovanovich Publications, 124 S. First St., Geneva IL 60134

*Community Television Review*

Quarterly journal of the National Federation of Local Cable Programmers with a practitioner focus which on occasion focuses on educational programming; $12-30/yr
Contact: NFLCP, 906 Pennsylvania Ave SE, Washington DC, 20003

*Connect*

First issue: October 1989. Magazine lists (by subject matter) quality educational programs available each month on television. Articles on use of television for education are also included.
Contact: The Crosby Vandenburgh Group, 420 Boylston St., Boston MA 02116-4000; (617) 424-7700

*DBS News*

Monthly newsletter $297/yr.
Contact: Phillips Publishing Co., 7811 Montrose Road, Potomac MD 20854

*E-ITV Educational & Industrial TV*

Monthly magazine $20/yr.
Contact: Broadband Information Services, Inc., 295 Madison Ave., New York NY 10017

*Educational Technology*

Topics include educational management/administration, educational technology systems, information resources with essays more common than research articles; $89/yr.
Contact: 720 Palisade Ave., Englewood Cliffs N.J. 07632

*Electronic Learning*

Contact: Scholastic, Inc., 730 Broadway, New York NY 10003-9538

*The Futurist*

Bimonthly publication of the World Future Society on widely varied topics and includes trends & forecasts in technology and communications. $30/year nonmembers
Contact: World Future Society, 4916 St Elmo Ave, Bethesda MD 20814

*Media and Methods*

Magazine consisting of practical articles for innovative learning strategies in junior high through college level courses
Contact: 1511 Walnut St., Philadelphia PA 19102

*Satellite Communications*

Monthly magazine $27/yr.
Contact: Cardiff Publishing Co., 6530 South Yosemite St., Englewood CO 80111

*Satellite Orbit*

Monthly listing of satellite programs & related articles
Contact: CommTek Publishing, 8330 Boone Blvd, Suite 600, Vienna VA 22180, (800) 792-5541

*Satellite TV Buyer's Guide*

Fortuna Communications Corporation, P.O. Box 308, Fortuna, CA 95540-0308 (707) 725-6951
*Satellite TV Week (Weekly Program Guide)*

Fortuna Communications Corporation, 767 Third Ave., New York, NY 10017, (212) 888-4911

*TechTrends*

Practitioner oriented magazine for leaders in education & training including articles on educational telecommunications, $24/yr nonmembers
Contact: Association for Educational Communications and Technology, 1126 Sixteenth Street NW, Washington DC 20036

*Telecommunications Policy*

Butterworth Publishers, 80 Montvale Ave., Stoneham, MA 02180.

*T.H.E. Journal (Technological Horizons in Education)*

Subscriptions are free to practitioners. Articles are on all aspects of education technology applications. It is an excellent resource on programs, conferences, equipment, & materials
Contact: Information Synergy Inc, 2626 S. Pullman, Santa Anna CA 92705

*Training and Development Journal*

Monthly publication of the American Society for Training & Development is practitioner oriented with sporadic articles on educational telecommunications
Contact: Training & Development Journal, 1630 Duke St, Box 1443, Alexandria VA 22313

**Newsletters**

*Communique'*

A bimonthly newsletter covering issues of interest and concern in the area of telecommunications, focusing primarily on the west.
Contact: The Western Cooperative for Educational Telecommunications, P.O. Drawer P, Boulder, CO 80301-9752; (303) 497-0231.

*Ed Newsletter*

Applied Business Telecommunications, Box 5106, San Ramon, CA 94583.

*International Teleconferencing Association (ITCA) Newsletter.*

Published monthly for members of the International Teleconferencing Association. Organizational membership, $500, Individual membership $100.

*Learning by Satellite Newsline*

Arts & Science Extension, 206 LSE, Oklahoma State University, Stillwater, OK 74078.

*Networking*

Quarterly newsletter
Contact: EDUCOM, PO Box 364, Princeton NJ 08540

*PBS/Library Pipeline*

Free newsletter on school library media programs
Contact: PIO/PBS American Library Association, 50 E. Huron St., Chicago IL 60611, (800) 545-2433

*PBS Video News*
Contact: PBS Elementary/Secondary Service, 1320 Braddock Place, Alexandria VA 22314-1698, (800) 424-7963

*Satellite News*
Weekly newsletter $197/yr.
Contact: Phillips Publishing Co., 7811 Montrose Road, Potomac MD 20854

*Satellite Week*
Weekly newsletter $571/yr.
Contact: Television Digest, Inc., 1836 Jefferson Place NW, Washington DC 20036

*TeleSpan Newsletter*
Monthly newsletter $207/yr.
Contact: Telespan, Inc., 50 West Palm Street, Altadena CA 91001

*Teleconference*
Bimonthly magazine $60/yr.
Contact: Applied Business Communications, Inc., Box 5106, San Ramon CA 94583-0906

**Books**

Distance Education/Learning

Bear, John. (1988) *Bear's Guide to Earning Nontraditional Degrees.* Berkeley, CA: Ten Speed Press.

*Distance Higher Education and the Adult Learner* (1986) Dutch Open Press: Heerlen.

Garrison, D.R. (1989) *Understanding Distance Education,* Routledge: New York

Greville, Rumble (1986), *The Planning and Management of Distance Education*, St. Martin's Press: New York.

Holmberg, Borje. (1981) *Status and Trends in Distance Education*, Nichols Publishing Co.: New York

Keegan, Desmond (1986), *The Foundations of Distance Education*, Croom Helm, Ltd: London.

Kuhns, Eileen and S.V. Martoranas. (1982) *Toward Academic Quality Off Campus: Monitoring Requirements of Institutional Accrediting Bodies and the States for Off Campus, Military Base and Study Abroad Programs, Committee on Postsecondary Accreditation.* San Francisco: Jossey Bass

Mugridge, Ian and David Kaufman (1986) *Distance Education in Canada*, Croom Helm: London.

Neil, Michael (ed) (1981), *Education of Adults at a Distance*, Kogan Page: London.

Telecommunications

Association for Educational Communications and Technology. (1989) *Copyright and Instructional Technologies: A Guide to Fair Use and Permissions Procedures* (2nd Edition).
$9.95 for AECT members & $14.95 for nonmembers
Contact: Association for Educational Communications and Technology, 1126 Sixteenth St. NW, Washington DC 20036, (202) 466-4780

Balwin, Thomas and D. Stevens McVoy. (1983) *Cable Communications*, Prentice-Hall: Englewood Cliffs, NJ.

Cambre, Marjorie. (1987). *A Reappraisal of Instructional Television*, ERIC Clearinghouse of Information Resources: Syracuse, NY 13244-2340

Coroporation for Public Broadcasting. Office of Education. *Instructional Television for Elementary Science* (1987) and *Instructional Television for Junior High Science* (1987).
Both publications are free and correlate CPS-funded science series with commonly used textbooks. CPS is a private, nonprofit corporation
Contact: Office of Education, Corporation for Public Broadcasting, 1111 Sixteenth St. NW, Washington DC 20036

Gayeski, Diane M. (1983) *Corporate and Instructional Video: Design and Production.* Prentice Hall: Englewood Cliffs, NJ.
Emphasis upon production, budgets, scheduling, etc. for televised instruction in a business environment.

Diamond, Robert. (1964) *A Guide to Instructional Television.* McGraw-Hill: New York.
A very thorough if somewhat dated book upon the use of ITV.

Gordon, George. (1970) *Classroom Television: New Frontiers in Instructional Television.* Hasting House Publishers: New York.
A well written humorous guide to teaching by television. Includes rules of thumb as well as research findings.

Hilliand, Robert. L. (ed) (1985) *Television and Adult Education.* Schenckman Books Inc.: Cambridge, MA.
A collection of international articles concerning the use of television for adult education.

Hudspeth, DeLayne and Ronald Brey. (1986) *Instructional Telecommunications*, Praeger: New York.

Lamb, Brian. (1988) C-Span:America's Town Hall, Acropolis Books, Washington, D.C.

Levine, T.K. (1987) *Teaching Telecourses: Opportunities and Options*, published by The Annenberg/CPB Project in cooperation with the PBS Adult Learning Service.

McInnes, James. (1980) *Video in Education and Training.* Focal Press: NY.

National School Boards Assocation (NSBA), Alexandria, VA. The following books are part of a series on planning for technology in the schools. They are practical and written for professional and lay educators

NSBA and U.S. West Communications. *Planning for Telecommunications: A School Leader's Primer.* (1989).

Franklin Hill. Tomorrow's Learning Environment. (1989).

Kitchen, Will and Karen Kitchen. *Two-Way Interactive Television for Distance Learning: A Primer.* (1988).

Niemi, A.J. and Dennis Gooler. (1987) *Technologies for Learning Outside the Classroom: New Directions for Continuing Education*, No. 34, Jossey-Bass: San Francisco

Ostendorf, Virginia. *Teaching Through Interactive Television*, PO Box 2896, Littleton CO 80161-2896

Ostendorf, Virginia (1989) *What Every Principal, Teacher, and School Board Member Should Know About Distance Education*, Virginia Ostendorf, Inc, POB 2896, Littleton CO 80161-2896.

Roberts, Nancy, George Blakeslee, Maureen Brown, and Cecilia Lenk. (1990) *Integrating Telecommunications into Education.* Englewood Cliffs, New Jersey: Prentice Hall.

An introductory practical primer on uses of telecommunications in the classroom including getting started, available services, school applications of the languages, sciences and social studies, and a description of the features of the various telecommunications technologies.

U.S. Congress, Office of Technology Assessment, (1989) *Linking for Learning: A New Course for Education*, OTA-SET-430 (Washington, D.C: U.S. Government Printing Office, November 1989).

Focusing upon K-12 distance education, this report analyzes the attributes of the available technologies, examines current development within the field and discusses the potential role of Federal, State and local policies in encouraging more efficient and effective use of telecommunications in education.

Widner, Doug. (1986) *Teleguide:A Handbook on Video-Teleconferencing*, Public Service Satellite Consortium: Washington, DC

Practical guide for the practitioner which includes comments from interviews of those involved in teleconferencing.

*Designing Learning Environments for Telecommunications*

Council of Educational Facility Planners. *Guide for Planning Educational Facilities.*

Address: 1060 Carmack Road # 160, Columbus, Ohio 43210.

A good overview of issues related to the design of education facilities, including mediated instruction written for the educator.

King, Jonathan and Robert W. Marans. (1979) *The Physical Environment and the Learning* Process. Survey Research Center, Institute for Social Research, University of Michigan. Ann Arbor, MI.

This is an extensive review of the literature on the relationship between the physical environment and learning. It does not specifically address the issues of distance education and is recommended only for those interested in knowing more about the influence of the environment within which learninger study and receive instruction.

Sleeman, Phillip J. and D. M. Rockwell (ed.) (1981) *Designing Learning Envrionments.* Longman, Inc.: New York.

A collection essays and articles concering the influence of the physical envrionment upon learning.

Annenberg/CPB Research Reports

The Annenberg/CPB Project has provided leadership in the instructional telecommunications field not only through the production of programming and demonstration projects, but also through sponsored research. These reports address a variety of issues related to instructional telecommunications including student outcomes, student and instructor characteristics, administration, policy, student and instructor attitudes, and the effectiveness of interactive video disk, hypermedia and electronic text. Below is a listing and description of the research funded by this project. Those interested in more information about these projects should contact the Annenberg/CPB Project, 1111 Sixteenth Street, NW, Washington, DC 20036, 202-955-5100.

Looking at the Quality of Video/Audio Courses

Grimes, Paul W., James F. Niss, and Joyce E. Nielsen. *An Evaluation of Learning and Attitudinal Changes of Students Enrolled in Economics U$A.* November, 1987.

Gilcher, Kay W. and Sally M. Johnstone. *A Critical Review of the Use of Audio/Graphic Conferencing Systems by Selected Educational Institutions*, 1988.

The Use of Telecommunications Technologies Among Colleges and Universities

Research Communications, Ltd., *A Study on the Supplemental Uses of the Annenberg/CPB Collection*, August 1988.

*Faculty Perspectives on the Role of Information Technologies in Academic Instruction,* December 1985.

Blackburn, Robert T. and Terry Ging. *Faculty and Administrator use of Annenberg/CPB PRoject Video Courses,* April 1986.

ELA Group, Inc. *The Adoption and Utilization of Annenberg/CPB Project Telecourses,* August 1986.

Student Telecourse Use

*A Study of Telecourse Students,* 1984.

Research Communications, Ltd. *Research on Student Uses of the Annenberg/CPB Telecourses in the Fall of 1984.* February 1985.

Research Communications, Ltd. *Student and Faculty Assessment of Annenberg/CPB Telecourses.* July 1988.

Measuring Student Outcomes From Video Courses

Shavelson, Richard J. et.al. *Evaluating Student Outcomes from Telecourse Instruction.* May 1986.

Measuring the Effectiveness of Demonstration Projects

Davis, Barbara Gross. *Nebraska Videodisc Science Laboratory Simulation,* March 1985.

Carey, John, and David Dozier. *Assessing Electronic Text for Higher Education: Evaluation Results From Laboratory and Field Tests,* July 1985.

*Telecourse Enhancement Through Electronic Mail,* February 1987.

Beeman, Willam O. *Intermedia, 1988.* February, 1988.

Pursuing Targets of Opportunity For Research

Riccobono, John, A. *Instructional Technology in Higher Education: A National Study of the Educational Uses of Telecommunications Technology in American Colleges and Universities,* May 1986.

Hezel, Richard T. *Statewide Coordination of Educational Telecommunications: A State-By-State Analysis,* October 1987.

Beaty, Sally V. *Telecourse Design and Needs Assessment Survey,* September 1988.

## DIRECTORIES

*1989 Downlink Directory*
Contact: Virginia A. Ostendorf, Inc., PO BOx 2896, Littleton CO 80161-2896

*Directory of Distance Education Through Telecommunications*
This directory provides a description of colleges and universities within the National University Continuing Education Association (NUCEA) using telecommunications to deliver credit and non-credit programming listed by school and disciplines.
Contact: Publications Division, NUCEA, One Dupont Circle, Suite 420, Washington, D.C. 20036; (202) 659-3130.

*New Technology Consultant's Directory*

A directory of companies and agencies providing satellite delivered services is offered.
Contact: New Technology Consultants, POB 27044, Minneapolis MN 55427, (612) 338-8027

*Teletraining Directory*

The directory provides a list of vendors, user organizations, and instructors active in distance education.
Contact: Virginia A. Ostendorf, Inc., PO Box 2896, Littleton, CO 80161-2896

*1989 Uplink Directory*
Contact: Virgina A. Ostendorf, Inc., PO Box 2896, Littleton, CO 80161-2896

*Satellite Learning*

Provides information about program offerings listed in the familiar TV Guide format. Also includes network contacts and profiles, technical viewing information, conference schedules, position openings, and reference guides.
Contact: Satellite Learing, P.O. Box 409, League City, TX 77573, 713-554-7677.

*Tapping the Potential of Educational Technology.*
Contact: Southeastern Educational Improvement Laboratory, March 1989.

## SECTION III
## ASSOCIATIONS/CONFERENCES

## SECTION III

## ASSOCIATIONS/CONFERENCES

Much of the most current information in the field of distance education can be obtained through participation in related conferences and associations. Below is a list of pertinent professional associations and meetings.

*American Association for Adult & Continuing Education (AAACE)*
(Also annual conference)
Media and Technology Unit, 1112 16th Street NW, Suite 420,
Washington DC

*Association for Educational Communications & Technology (AECT)*
(Also annual conference)
Division of Telecommunications, 1126 16th Street NW, Suite 700, Washington DC 20036

*Conference on Distance Teaching/Learning*
(Annual Conference)
Continuing & Vocational Education, University of Wisconsin-Madison, 225 North Mills Street, Madison, WI 53706

*EDUCOM*
October 14-17, 1990: Computing and Communications for Technology, Science, & the Arts
Contact: John Gehl, program chair, School of Information & Computer Science, Georgia Institute of Technology, Atlanta GA 30332-0280

*Electronic Mail Association*
1919 Pennsylvania Ave., Suite 300, Washington DC 20006

*International Council on Distance Education (ICDE)*
Gjerdrums vei 12, N-0486 Oslo 4, Norway

*ITCA International Teleconferencing Association*
1299 Woodside Drive, McLean VA 22102

*Instructional Telecommunications Consortium. An Affiliate of the American Association of Community and Junior Colleges.*
Serves as a vehicle for colleges interested in increasing and improving the use of technology-delivered distance and independent learning.
Contact: Joyce Edwards McGill, Executive Secretary, One DuPont Circle N.W., Suite 410, Washington, D.C. 20036-1176, (202) 293-7050

*Learning by Satellite*
(Annual conference)
Oklahoma State University, Learning by Satellite V, 205 Life Sciences East, Stillwater OK 747078-0276
(405) 744-5647

*National University Continuing Education Association (NUCEA)*
(Annual conference)
Division of Educational Telecommunications, One DuPont Circle, Suite 420, Washington DC 20036; (202) 659-3130

*National University Teleconference Network*
Hosts conferences in the fall and spring and a summer workshop.
Contact: NUTN, Room 332, Student Union Bldg., Oklahoma State University, Stillwater OK 74078-0653; (405) 744-5191

*Society for Applied Learning Technology*
The interests of the association center upon computers, videodiscs and videotapes
Contact: Carl R. Vest, 50 Culpepper St., Warrenton VA 22186

TeleCon, Applied Business Telecommunications, Box 5106, San Ramon CA 94583, 800-829-3400. Conferencing and trade show on teleconferencing.

*United States Distance Learning Association*
Box 5129, San Ramon, CA 94583, (415) 820-5845

*Western Cooperative for Educational Telecommunications.*
A project of the Western Interstate Commission on Higher Education. A member organization serving the entire education community (K-12, post-secondary and adult education) and focuses primarily on the west. Hosts an annual conference each fall covering education and telecommunications. Also publishes reports on policy and legislative activity in the West.
Contact: Sally Johnstone, Director, Western Cooperative for Educational Telecommunications, P.O. Drawer P, Boulder, CO 80301-9752; (303) 497-0231.

**SECTION IV**

**VENDORS**

# SECTION IV

# VENDORS

This list is by no means meant to be comprehensive. Likewise this list is not intended to promote any single company or corporation. It merely provides a listing of some of the established vendors who serve a national market. The purpose of this section is to provide the participant interested in developing telecommunications systems with a starting point.

For pricing information, refer to Appendix A, Construction Costs of Typical Public Television Stations, and Construction Costs of Typical Public Radio Stations, updated october 1989 by the U.S. Department of Commerce, National Telecommunications and Information Administration, Public Telecommunications Facilities Program.

**Product Directories**

*1989-90 Satellite Industry Directory to Buyer's Guide*
Satellite Communications, 6300 S. Syracuse Way, Suite 650, Englewood, CO 80111, (303) 220-0600.

*Video Systems*. November 1988.
This issue includes a comprehensive description of equipment suppliers listed alphabetically by production equipment type.

**Audio Conferencing/Audio Graphics**

Darome

| | |
|---|---|
| San Francisco CA | 800-832-3373 |
| Danbury CT | 800-243-0991 |
| Atlanta GA | 800-DAROME-9 |
| Chicago IL | 800-435-6174 |
| Minneapolis MN | 800-DAROME-2 |
| Los Angeles CA | 800-776-9090 |
| New York NY | 800-922-1124 |
| Dallas TX | 800-735-0735 |
| Washington, DC | 800-835-9700 |

DataBeam Corporation
3256 Lochness Drive
Lexington KY 40503
606-273-3204

Optel Communications, Inc.
322 Eighth Avenue
New York NY 10001
212-741-9000

Shure
222 Hartrey Avenue
Evanston IL 60202-3696
800-447-4837

**Satellite/Sophisticated Telecommunications**

Scientific Atlanta
4025 Pleasantdale Road

Atlanta GA 30340
800-722-2009

**Video Conferencing**

Vitalink Videoconferencing

**Compressed Video**

GEC Video Systems
The English Electric Corporation
106 Purdy Avenue
Port Chester NY
914-937-7450
800-GEC TECH

VideoTelecom Corp
1908 Kramer Lane
Austin TX 78758
512-834-9734

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Widner, D. (1986). Teleguide: A Handbook on Video Teleconferencing. Public Service Satellite Consortium:
Washington, DC.

Ohler, J. (1989). What's On Line for Educators. *Electronic Learning*. April, 34-35.

# SECTION V

# GLOSSARY OF TELECOMMUNICATIONS TERMINOLOGY

## SECTION V

## GLOSSARY OF TELECOMMUNICATIONS TERMINOLOGY

**Analog**: A continuously varying electrical signal in the shape of a wave, transmitted electronically in a form analogous to the spoken word; a form of information which is represented by continuous wave forms that vary as the source varies. Contrast to digital

**Antenna**: A structure which transmits or receives electro-magnetic signals.

**ASCII**: American Standard Code for Information Interchange; usually pronounced: "Askee". An eight-level code for data transfer adopted by the American Standards Association to achieve compatibility between data services.

**Asynchronous**: Characteristic of any operation that is independent of a master clock or time signals; also refers to information that is sent or exchanged independent of any specific time.

**Audio graphics**: Refers to the transmission of graphics and text information over a narrowband telecommunications channel, such as a telephone line or a sub carrier.

**Audio-speaker-microphone unit**: Equipment that usually includes at least one speaker, multiple microphone and a telecommunications interface to accommodate a group of people in a teleconference.

**Audio-teleconferencing**: Two-way electronic voice communication between two or more groups, or three or more individuals, who are in separate locations.

**Bandwidth**: The maximum frequency (spectrum) measured in Hertz or cycles per second, between the two limited frequencies of a transmission channel; the range of frequencies that can be carried by a transmission medium without undue distortion.

**Baud**: A rate of information flow. Given in bits per second (bps), the rate is the highest number of single elements (bits) that can be transferred between two devices in one second.

**Binary**: The basis for calculations in computers; a numbering system having only two possible states - On or Off as designated by 0 and 1.

**Bit**: A contraction of the term binary digit. A bit can be either 0 or 1 and is the smallest possible unit of information making up a character or word in digital code.

**BITNET**: A general purpose international academic data network for messaging and simple file transfer.

**Bandwidth**: A measure of the information carrying capacity of a communications channel; the higher (wider) the bandwidth, the greater the information carried.

**Bridge**: A device that is designed to interconnect with three or more telecommunication channels, such as telephone lines.

**Broadband**: Communications channels that are capable of carrying a wide range of frequencies. Broadcast television, cable television, microwave and satellite are examples of broadband technologies. These technologies are capable of carrying a great deal of information in a short amount of time, but are more expensive to use than technologies like telephone which require less bandwidth.

**Broadcast**: Transmission of information in one direction that is available to an undifferentiated audience.

**Brokers**: Organizations which maintain primary leases or ownership of communications satellite time and provide subleases to teleconference originators.

**Buffer**: A temporary storage facility used as an interface between system elements whose data rates are different.

**Cable**: An assembly of one or more insulated wires in a common protective sheath.

**Cable television**: A transmission system that distributes broadcast television signals and other services by means of coaxial cable. Most cable systems have the potential for two-way communication in addition to broadcast television.

**CAD system**: Computer-aided design system.

**Carrier**: A high-frequency radio signal which is modulated to carry information long distances through space or via cable.

**C-Band**: Frequencies from 4 to 6 gigahertz (Ghz) used to transmit and receive signals to and from satellites.

**Channel**: (1) A half-Circuit; (2) A radio frequency assignment (which is dependent upon the frequency band and the geographic location).

**Chip**: A thin silicon wafer on which electronic components are deposited in the form of integrated circuits; the basis of digital systems.

**Circuit**: A means of both-way communication between two or more points.

**Closed Circuit Television**: A transmission system that distributes television programs--live or tape, both audio and video, to a limited network connected by cable. The network may consist of one institution or several. The telecast cannot be received by other television sets outside the selected network. The signal does not have to meet FCC commercial specification.

**C/N or C/NR**: Carrier to noise ratio. The ratio of signal power to noise power in a system, usually expressed as a power ratio in dB. See S/N.

**Coaxial Cable**: A metal cable consisting of a conductor in the form of a tube which can carry broadband signals by guiding high-frequency electromagnetic radiation.

**Codec**: A coder-decoder that is used to convert analog signals such as video or voice into digital form for transmission over a digital medium and, upon reception, reconverts the signals to the original analog form; may also perform other signal processing functions; coder-decoder, or compressor-decompressor.

**Common carrier**: A telecommunications company that is regulated by government agency and offers communications relay services to the general public via shared circuits through published and non-discriminatory rates.

**Communications satellite**: A satellite in earth orbit which receives signals from an earth station, and retransmits the signal, video and/or audio, to other earth stations.

**Compressed video**: Video images that have been processed to remove redundant information, thereby reducing the amount of bandwidth required to send them over a telecommunications channel; instead of transmitting full-motion video frames, only the changes in moving frames are captured and transmitted.

**Computer conferencing**: Group communication through computers; the use of shared computer files, remote terminal equipment and telecommunications channels for two-way group communication.

**Conference call**: An operator-assisted telephone call connecting more than two individuals.

**Consortium**: A voluntary organization loosely affiliated for a specific purpose.

**Database**: An organized collection of files and information stored on a disk available for update and retrieval.

**DBS**: Direct broadcasting satellite service.

**DDS**: Digital Data Service

**Dedicated line**: Communications circuit used for one specific purpose; i.e., for interactive portion of a teleconference.

**Downlink**: Satellite receiving antenna

**Dial-up teleconferencing**: Using a public phone line to connect with a teleconference, either with or without operator assistance.

**Digital**: Discrete signals, as opposed to continuously variable analog-type signals.

**Direct Broadcast Satellite (DBS)**: A satellite designed with sufficient power so that inexpensive earth stations can be used for direct residential reception.

**Dish**: A parabolic antenna that is the primary element of a satellite earth station.

**Domestic satellite**: A satellite that provides communication services primarily to one nation.

**Drop**: The portion of outside telephone plant which extends from the telephone distribution cable to the subscriber's premises.

**Earth station**: The ground equipment including a dish and its associated electronics used to transmit and/or receive satellite communications signals.

**Electronic mail**: Communications between individuals or groups via electronic means, e.g., computer mail and facsimile.

**End User**: The ultimate consumer of a service.

**Facilitator**: The individual responsible for the local component at a teleconference site. May or may not be an expert in the subject matter.

**Facsimile**: A device that electronically transmits and reproduces page copies and documents via a telecommunications channel, usually a telephone line; sometimes called a telecopier.

**Feedback**: (a) video - distortion of the picture caused when a video-signal re-enters the switcher and becomes overamplified; (b) audio - unpleasant howl from the loud speaker, caused when the sound inadvertently is fed into the microphone and is overamplified.

**Fiber optic**: A technology that transmits signals through a pulsating light beam over a network of glass fibers encased in cables. Each fiber is capable of carrying from 90 to 150 megabits of digital information per second or 1,000 voice channels.

**Footprint**: The geographic region on the earth which can easily receive and interpret a signal from a communications satellite.

**Four-wire circuit**: A circuit that has two pairs of conductors (four wires), one pair for the send channel and one pair for the receive channel; allows two parties to talk and be heard simultaneously.

**Frequency**: The rate at which a current alternates, measured in Hertz on a telecommunications medium.

**Full-duplex**: A communication channel over which both transmission and reception are possible in two directions at the same time; e.g., a four-wire circuit.

**GHz**: GigaHertz, 1 billion cycles per second. Giga is a prefix meaning one billion.

**Geo**: Geosychronous or geostationary.

**Geostationary**: Describes a satellite in orbit 22,300 miles above the equator and which revolves around the earth with an angular velocity equal to that of the earth's rotation about its own axis. The satellite's position relative to the earth's surface is constant, so little or no ground antenna tracking is needed, therefore appears to hover over one spot on the earth's equator.

**Geosynchronous**: An orbit whose period exactly matches the Earth's rotation rate (about 24 hours).

**Half-duplex**: A communications channel over which both transmission and reception are possible but only in one direction at one time; e.g., a two-wire circuit.

**Hardware**: Physical equipment components; equipment as opposed to software (programs).

**HDTV**: Higher (than normal) definition TV.

**Hertz (Hz)**: The unit of frequency. One Hertz is equal to one cycle per second. Names in honor of Heirich Hertz, first to detect such waves in 1883.

**High-resolution graphics**: A system that provides a greater resolution than the standard 525-line video image; allows more detailed graphics to be seen clearly; often refers to a system with a resolution of 1,000 lines.

**Hollywood syndrome**: The tendency to base one's video teleconferencing behavior on a model that includes a highly polished presentation rather than interaction and the use of fast-paced visuals for effect rather than substance.

**Host computer**: A computer interconnected with a network of computers. The host computer performs the computational jobs for the network.

**Hosts**: Computers (not terminals) that process data, act as data sources or destinations in a communications network.

**Instructional Television Fixed Service (ITFS)**: A non-broadcast television service that is typically used for closed-circuit educational applications and requires special antennas and converters to translate the signals for viewing on ordinary television sets.

**Integrated Services Digital Network (ISDN)**: A digital telecommunications channel that allows for the integrated transmission of voice, video and data; sometimes referred to as "narrowcasting." A local (up to 25-mile radius) one-way, over-the-air block of television channels operating at microwave (very high) frequencies. Some are reserved for educational purposes. Requires special antennas and converters to translate the signals for viewing on ordinary television sets.

**Interactive media**: Refers to telecommunications channels that allow the two-way exchange of information.

**Interface**: The place at which two systems or pieces of equipment meet and interact with each other.

**ISDN**: Integrated Services Digital Network, a planned hierarchy of digital switching and transmissions systems.

**Kb/s**: Kilobits per second, or 1,000 bits per second.

**Kilohertz**: One thousand Hertz (cycles per second).

**Ku Band**: Frequencies in the 11 to 14 gigahertz band used to send and receive signals to and from satellites.

**LAN**: Local Area Network; a data transmission facility connecting a number of communications devices (e.g., computers, printers, mass storage units) within a single building or campus of buildings.

**LATA**: Local Access Transport Areas; local telephone service areas created by divestiture of the local Bell operating companies of AT &T.

**Laser communications**: A system for transmitting coherent beams of light which may form high-capacity communications links in the future.

**Leased line**: A line rented from a telephone company for the exclusive use of a customer. May also be called a dedicated line.

**Links**: Communication pathways between nodes.

**LNA - Low Noise Amplifier**: A special amplifier that boosts the satellite signal while contributing a negligible amount of noise.

**LS/2000**: A library automation"Local System" offered by OCLC, Inc., which provides catalog, circulation, serials and acquisition systems.

**Mb/s**: Megabits per second, or one million bits per second.

**Microwave transmission**: The transmission of information over distances using radios that operate in the microwave spectrum (generally above 2GHz), requiring line-of-sight transmission between sending and receiving antennas.

**Meet-Me Bridge**: A type of telephone bridge that can be accessed directly by calling a certain access number; provides dial-in teleconferencing. The term "meet-me bridging" refers to the use of this type of bridge.

**Meet-Me Teleconferencing**: A teleconference that uses a meet-me (dial in) bridge to interconnect telephone lines.

**Megahertz**: One million Hertz (cycles per second).

**Memory**: A computer's information storage capability.

**Menu**: A list of symbols and functions that can be selected on a computer system.

**Modem**: Modulator-demodulator; a device that modulates and demodulates a signal (varies to amplitude, frequency or phase) for transmission over a telecommunications channel; a device that connects terminals and hosts through analog links by converting data signals to analog signals and back again.

**Modulate**: A process imposing message information on a carrier by varying the amplitude, frequency or phase of a wave.

**Multiplex**: Transmission of two or more information streams over a single physical medium. The two most common methods of multiplexing are frequency division multiplexing (FDM) and time division multiplexing (TDM).

**Narrowband**: A telecommunications medium that carries lower frequency signals; includes telephone frequencies of about 3,000 Hertz and radio subcarrier signals of about 15,000 Hertz.

**Network**: A set of nodes connected via voice, data, or video communications to facilitate the exchange of information.

**Networking**: The ability to (1) exchange information between users or (2) share the resources involved in this process. A network consists of two or more information sources or destinations linked via communications media for the purposes of information exchange or resource sharing.

**OCLC**: Online Computer Library Center; a special purpose non-profit international computer network and online library database for cataloging and interlibrary loan services.

**PBX**: Private Branch Exchange, a computerized version of the telephone switchboard but with an expanded range of voice and data services; a private telephone exchange that serves a particular organization and has connections to the public telephone network; refers to a multi-line telephone exchange terminal with various features for voice and data communications.

**PC**: Personal Computer, microcomputer.

**Peripheral device**: A piece of equipment that is attached to but not a direct part of a central unit; e.g., an input or output device attached to the central processing unit of a computer.

**Plotter**: A computer output device that draws information, such as curves and lines, on paper.

**Port**: A circuit in a electronic device for the input or output of signals.

**Protocol**: A set of messages with specific formats and rules for exchanging communications and assuring end-to-end data integrity of links, circuits, messages, sessions, and application processes.

**Reflector**: The antenna's main curved "dish" which collects and focuses signals onto the secondary reflector or the feed.

**Repeater**: A bi-directional device used in channels to amplify or regenerate signals.

**Room integration**: Refers to the design and/or construction of a total teleconferencing room, including the equipment, associated electronics and environment.

**Routing**: Selecting the minimum delay path (and/or minimun cost path) in a network for a message of packet to reach its destination.

**RS-232-C**: A standard interface between a piece of equipment and a telephone circuit.

**Satellite relay**: an active or passive satellite repeater that relays signals between two earth stations.

**SFA-FM**: Subsidiary Communications Authorization; an electronic technique that places the radio signal on the FM spectrum: these signals can only be picked up with special tuners that distinguish the SCA from the FM signals.

**Scan-converter**: A device that converts video frequency signals to audio frequencies and vice versa; used in freeze-frame video to transmit video signals over telephone lines.

**Scramble**: Deliberate distortions of information to permit only authorized reception.

**Simplex**: A communications system capable of sending information in only one direction.

**Slow scan video**: 1) A device that transmits and/or receives still video pictures over a narrowband telecommunications channel; 2) May refer specifically to a still frame video unit that accepts an image from a camera or other video source one line at a time, necessitating that the subject in front of the camera remain stationary for a number of seconds.

**SMATV**: Satellite master antenna television. A distribution system that feeds satellite signals to a hotel, motel, apartment complex, etc.

**S/N or S/NR - Signal to Noise Ratio:** Ratio of the signal power to the moise power in a specified bandwidth, expressed in dBh. S/N=S/C + 37.5 dB.

**Software**: A set of programs, procedures or related documentation associated with a system; materials for use with audiovisual equipment; programs in contrast to equipment.

**Star network**: A communications system consisting of one central node with point-to-point links to several other nodes.

**Station**: The assigned satellite location.

**Still-Image Video**: A system by which still images are transmitted over standard telephone lines, usually allowing for real-time interaction between location.

**Switch**: Mechanical or solid-state device that opens or closes circuits, changes operating parameters or selects paths or circuits on a space or time division basis.

**Synchronous**: An operation where a series of events takes place under the control of a clocking device; also refers to information that is sent or exchanged at a certain time.

**Synchronous Transmission**: Data characters and bits are transmitted at a fixed rate with the transmitter and receiver synchronized. This eliminates the need for start-top elements, thus providing greater efficiency.

**T-1 (DS-1)**: A digital carrier of 1.54 mb/s data rate; a general term for a digital carrier (DS-1) available for high-volume voice or data traffic and for compressed video.

**T-3 (DS-3)**: A carrier of 45 mb/s bandwidth; one T-3 channel can carry 28 T-1 channels. Used for digital video transmissions or for major PBX-PBX interconnection.

**T-Carrier**: A series of transmission systems using pulse code modulation technology at various channel capacities and bit rates (e.g., T1,T2, T3, T4).

**Telecommunications**: The use of wire, radio, optical or other electromagnetic channels to transmit or receive signals for voice, and data communications; communications over distance using electrical means.

**Teleconferencing**: Two-way electronic communication between two or more groups, or three or more individuals, who are in separate locations; includes group communication via audio, audiographics, video and computer systems.

**Telephone**: A two-way device used mainly for voice communications which converts audible signals into electrical waves which can then be transmitted over communications channels.

**Telephone, electronic**: A telephone set which employs electronic circuitry to provide additional features and improved performance.

**Telephone Conference Bridge**: A device that is designed to link three or more telephone channels for a teleconference; usually refers to a bridge that provides only dial-up teleconferencing where an operator calls each participant. Contrast to meet-me bridge.

**Teletext**: A broadcasting service using several otherwise unused scanning lines (vertical blanking intervals) between frames of TV pictures to transmit information from a central data base to receiving televisions sets.

**Telewriter**: A general term that refers to an electronic device that produces free-hand information that can be sent over a telecommunications channel, usually a telephone line.

**Terminal**: (1.) A point at which information can enter or leave a communication network. (2.) An input/output device designed to receive or send source data.

**Terrestrial Carrier**: A telecommunications transmission system using land-based facilities (microwave towers, telephone lines, fiber optic cable), as distinguished from satellite transmission.

**Transceiver**: A terminal that can both transmit and receive information.

**Translator**: In broadband network operation, a device which is located in a central retransmission facility to filter incoming microwave signals and retransmit them in a higher frequency band.

**Transmission Channel**: The medium by which a signal is sent and received between separate locations.

**Transmission Loss**: The decrease in signal along a circuit due to resistance or impedance.

**Transmitter**: A device for tansmitting a coded signal when operated by any one of a group of actuating devices.

**Transponder**: A microwave repeater (receiver and transmitter) in a satellite that amplifies and downconverts the frequency of a received band of signals. Domestic communications satellites use either 12 or 24 transponders, which usually have a 36 MHz bandwidth.

**Trunk**: A large-capacity, long-distance channel used by a common carrier to transfer information between its customers.

**Turnkey Supplier**: A vendor or contractor that supplies all components and installation services required for an operational teleconferencing.

**TVRO**: Television receive only. An earth station capable of receiving satellite TV signals but not of transmitting them.

**Two-wire circuit**: A typical telephone circuit on the public switched network; a circuit formed by two conductors insulated from each other to provide a send and receive channel in the same frequency.

**Uplink**: An earth station that transmits a signal to a communications satellite.

**Video compression**: A coding technique used to reduce the bandwith required for the transmission of video images by reducing redundant information within or between video frames; also called bandwidth compression, data compression or bit rate reduction.

**Video hard copy unit**: A device that electronically reproduces video images on paper.

**Video pointer**: An electronic device that produces an arrow or symbol that can be positioned anywhere on a displayed image to point out or highlight information.

**Video Teleconferencing (Videoconcerencing)**: Two-way electronic voice and video communication between two or more groups, or three or more individuals, who are in separate locations; may be fully interactive voice and video

**Videodisc**: A hard disc that stores information in microscopic "pits" indented into the surface; provides a high-capacity storage medium of over 50,000 frames of information; used to store and retrieve video, audio and other information.

**Videotex**: A service similar to teletext except that information is delivered by telephone channels and a user can interact with the data base to select information for viewing.

**Virtual space**: Refers to a type of videoconference in which each participant is assigned a separate camera and is see on a separate monitor, large screen or assigned spatial area.

**Voice actuated: The ability of a piece of equipment to become activated in response to the sound of a voice.**

**Voice/Data terminal**: A desktop device that has the combined capability for voice and data communications.

**Voice Grade Channel**: A telephone circuit that carries signals in the voice frequency range of 300 to 3,000 Hertz.

**Voice-Switched microphone**: A microphone that is activated by a sound or sufficient amplitude; generally allows only one person to speak at a time.

**Voice-switched video**: Refers to a type of videoconference in which the cameras are activated by voice signals to send a picture of a particular person in the group. Not all participants can be seen at any one time in contrast to continuous presence video.

**Voice-Switching**: An electrical technique for opening and closing a circuit in response to the presence or absence of sound.

**VSAT**: Very Small Aperture Terminal, satellite dish used for reception of high speed data transmissions. Can also transmit slow-speed data.

**Wide Area Telecommunications Service** (WATS): A type of telephone service in which subscribers pay a base rate rather than a charge per call.

**Wide Area Telephone Service (WATS)**: A flat rate or measured bulk rate long distance telephone service provided on an incoming or outgoing basis. WATS permits a customer, by use of an access line, to make telephone calls to any dialable telephone number in a specific zone for a flat or bulk monthly rate using an 800 number. INWATS permits reception of calls from specific zones over an access line in like manner. Canada has been divided into seven zones of increasingly greater coverage depending on the location of the customer.

# APPENDIX A
# COSTS OF TYPICAL PUBLIC TELECOMMUNICATIONS EQUIPMENT
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